

What is claimed is:

1. A medicament delivery system comprising:
a reservoir for storing a medicament,
a channel for carrying a volume of the medicament from the reservoir into a passage within a perforator, and
an actuator coupled to the perforator and capable of applying a decelerating force thereto for causing the inertia of the volume to eject the medicament from the hollow perforator.
2. The device of claim 1 further comprising a flexure mounted on the actuator and connected to the reservoir.
3. The device of claim 1 wherein the actuator comprises a magnetic coil.
4. The device of claim 1 further comprising a housing having an aperture disposed therein.
5. The device of claim 4 wherein the housing further comprises a bulge area surrounding the aperture.
6. The device of claim 5 wherein said bulge area is made of a material selected from the group of glass, polymer, metal, ceramic, and composite.
7. The device of claim 5 wherein the bulge area is configured to stretch the skin at its point of contact.
8. The device of claim 7 wherein the bulge area comprises flanges or a circular ridge.
9. The device of claim 1 wherein said reservoir further comprises a gas source.

10. The device of claim 9 wherein said gas source provides pressure to supplement the inertia utilized to deliver the medicament.

11. The device of claim 1 wherein said reservoir is made from a material is selected from the group of glass, polymer, metal, ceramic, and composite.

12. The device of claim 1 wherein said reservoir has a volume of about 10 microliters to about 50 milliliters.

13. The device of claim 1 wherein said reservoir further comprises a relief valve.

14. The device of claim 1 wherein said perforator is a microtube.

15. The device of claim 1 wherein said perforator has a volume of about 0.5 nanoliter to about 10 microliters.

16. The device of claim 1 wherein said perforator has a length of about 200 micrometers to about 5 millimeters.

17. The device of claim 1 wherein said perforator has an orifice of about 20 micrometers to about 800 micrometers in diameter.

18. The device of claim 1 wherein said flexure is a membrane.

19. The device of claim 18 wherein the membrane is made of a material selected from diamond coated titanium, rubber, latex, metal, polymer, and ceramic.

20. The device of claim 1 wherein the device comprises a plurality of perforators.

21. The device of claim 1 wherein the device comprises a plurality of reservoirs in fluid connection with at least one perforator.

22. The device of claim 1 further comprising a sensor for determining the position of the flexure.

23. The device of claim 1 further comprising a sensor for determining the position of the perforator.

24. The device of claim 1 further comprising a sensor for determining the position of the device along the surface of the skin.

25. The device of claim 24 wherein the sensor is selected from the group of an optical sensor, an impedance sensor, a temperature sensor, and a pH sensor.

26. The device of claim 1 wherein said actuator activates the flexure by a piezoelectric, magnetostriction, magnetic, electro-magnetic, mechanical, hydraulic, or pneumatic means.

27. The device of claim 1 wherein the reservoir is connected to the perforator by a length of flexible tubing.

28. The device of claim 1 wherein said medicament is selected for local delivery.

29. The device of claim 28 wherein said medicament is selected to treat a skin disorder.

30. The device of claim 28 wherein said medicament is a local anesthetic.

31. The device of claim 28 wherein said medicament is selected from the group of analgesics, antipuretics, antibiotics, antifungals, anti-inflammatories, antivirals, antineoplastics, antipsoriatic, anti-seborrheic agents, agents to treat burns, cosmetic agents, depigmenting agents, hair growth retardants, hair growth stimulants, retinoids, local anesthetics, pigmentation agents, and steroids.

32. The device of claim 1 wherein said medicament is selected for systemic delivery.

33. The device of claim 32 wherein said medicament is selected from the group of Alzheimer's Disease agents, antibiotic agents, Anti-emetic agents, Anti-epileptic agents, Anti-pyretic agents, analgesics, Cardiac treatment agents, Contraceptive agents, Deep Vein Thrombosis Prophylaxis agents, Diagnostic Agents, Hemophilia treatment agents, Hepatitis C treatment agents, HIV/AIDS treatment agents, Hormones, Immunosuppressants, Infertility treatment agents, Insomnia treatment agents, Migraine treatment agents, Multiple sclerosis treatment agents, Osteoporosis treatment/prevention agents, Pain management agents, Parkinson's Disease treatment agents, Psychiatric drugs, Rheumatoid arthritis treatment agents, Vaccines, Vitamins, Protein and Peptides, nucleic acid molecules, and Monoclonal antibodies.

34. The device of claim 1, wherein the medicament provides a slow release of drug over time.

35. The device of claim 34, wherein the medicament comprises a carrier selected from polyanhydrides, polyesters, polyester derivatives, poly(orthoesters), photopolymerizable hydrogels, sucrose acetate isobutyrate, lipid foams, collagen, alginates, hyaluronic acid derivatives, methylcellulose, sodium carboxymethylcellulose and polyvinylpyrrolidone.

36. The device of claim 34, wherein the medicament is formulated in aqueous suspensions or suspensions in oil.

37. The device of claim 28-33, wherein the medicament provides a slow release of drug over time.

38. The device of claim 28-33, wherein the medicament comprises a carrier selected from polyanhydrides, polyesters, polyester derivatives, poly(orthoesters), photopolymerizable hydrogels, sucrose acetate isobutyrate, lipid foams, collagen, alginates, hyaluronic acid derivatives, methylcellulose, sodium carboxymethylcellulose and polyvinylpyrrolidone.

39. The device of claim 28-33, wherein the medicament is formulated in aqueous suspensions or suspensions in oil.

40. A method of delivering medicament comprising:
providing a medicament in a reservoir in fluid connection with a hollow perforator,
and
accelerating said perforator followed by abrupt deceleration such that the volume of
medicament is ejected into the skin.

41. The method of claim 40 wherein the method is employed to deliver
medicament during massage.

42. A method of manufacturing a drug delivery device comprising the steps of:
providing a reservoir for storing a medicament,
providing a channel for carrying a volume of medicament from the reservoir into a
passage within a perforator, and
providing an actuator coupled to the perforator and capable of applying a decelerating
force thereto for causing inertia of the volume to eject the fluid from the hollow perforator.